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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/680,969	10/08/2003	Christo P. Bojkov	TI-35798 (032350.B526)	6084

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EXAMINER
WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	**Application No.** 10/680,969	**Applicant(s)** BOJKOV ET AL.
	Examiner Harry D. Wilkins, III	**Art Unit** 1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.
  4a) Of the above claim(s) *11-20* is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-10* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *08 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  Paper No(s)/Mail Date *10/8/03*.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-10, drawn to a method for electroplating electronic devices, classified in class 205, subclass 102.

   II. Claims 11-20, drawn to a system for electroplating electronic devices, classified in class 204, subclass 199.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process as claimed can be practiced by another and materially different apparatus, such as one which lacks the rotator to rotate the workpiece during processing.

3. Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Wade Brady on 17 February 2006 a provisional election was made with traverse to prosecute the invention of group I, claims 1-10. Affirmation of this election must be made by applicant in replying to this Office

action. Claims 11-20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 1, 3, 9 and 10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rose (US 3,821,785).

Rose clearly anticipates the invention as claimed. Rose teaches (see abstract and col. 4, lines 27-36) a method of electroplating nickel on a bump/stud substrate. Since the method occurs in a discrete step, it inherently occurs with a first current level (on) and a second current level (off). The step of turning off the current would inherently operate to provide a relaxation period for the electroplated material to come to an equilibrium. Due to the inherent underlying reaction, the first current must be cathodic.

8. Claims 1, 3, 9 and 10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bursey et al (US 4,038,158).

Bursey et al anticipate the invention as claimed. Bursey et al teach (see abstract and col. 2, line 66 to col. 3, line 24) a method for electroplating including placing an outer surface of a substrate in contact with a solution comprising a conductive material, passing electrical current through the solution and the substrate so as to cause the conductive material to deposit on the substrate under the emf caused by the electrical current (i.e.-performing electroplating) and varying the level of the electrical current from a first current level to a second current level to provide differing rates of deposition, wherein the second current level provided for a relaxation period to allow the conductive material deposited on the substrate to come to an equilibrium.

Regarding claim 3, the first current was cathodic.

Regarding claims 9 and 10, the conductive material deposited on the substrate would have inherently been considered a bump or stud.

9. Claims 1-3, 5-6, 9 and 10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Shindo et al (US 4,857,154).

Shindo et al anticipate the invention as claimed. Shindo et al teach (see abstract, col. 2, line 54 to col. 4, line 49 (third method)) an electroplating method for depositing zinc from the electrolyte including varying the level of the electrical current from a first current level to a second current level to provide differing rates of deposition, wherein the second current level provided for a relaxation period to allow the conductive material deposited on the substrate to come to an equilibrium.

Regarding claims 2 and 6, Shindo et al teach (see "Method 3" spanning cols. 6 and 7) that the second current level was no current. The rest time was at least 1 msec (0.001 sec).

Regarding claim 3, the first current was cathodic.

Regarding claim 5, the third method of Shindo et al further included a third cathodic current level applied after the initial adhesion layer had been formed.

Regarding claims 9 and 10, the conductive material deposited on the substrate would have inherently been considered a bump or stud.

10. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Taylor et al (US 6,080,504).

Taylor et al clearly anticipate the invention as claimed. Taylor et al teach (see abstract and figure 1B) a method of electroplating including varying the level of electrical current from a first level to a second level wherein the second level provided a relaxation period of the electroplated material.

Regarding claim 2, Taylor et al suggest (see cols. 4-5) a preferred frequency of 500-1500 Hz. Given a frequency of 500 Hz, the duration from cathodic pulse to cathodic pulse would have been 0.005 seconds. The relaxation pauses taught by Taylor et al would inherently be considered to be within the presently claimed time range.

Regarding claims 4 and 7, the preferred first cathodic current duration was 3-4 milliseconds (0.003-0.004 seconds).

Regarding claims 5 and 6, Taylor et al suggest using a third cathodic current level (all be it at the same level and duration as the first pulse).

Regarding claim 8, Taylor et al suggest using a third current level after the relaxation period of anodic current.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al (US 6,080,504).

If the disclosure of Taylor et al is considered to not teach the claimed duration of the relaxation pulse, then it would have been considered obvious to one of ordinary skill in the art to have optimized the duration of the relaxation pulse in order to optimize the relaxation properties.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Harry D. Wilkins, III
Harry D Wilkins, III
Examiner
Art Unit 1742

hdw